

WHAT IS CLAIMED IS:

1. Apparatus for holding an organ or a tissue for at least one of perfusion, storage, diagnosis and transport of the organ, comprising:

an organ or tissue transporter;

a portable housing having one or more heat transfer surfaces;

a compartment within the transporter having one or more heat transfer surfaces arranged to transfer heat between a cooling source in said transporter and at least a part of one of the one or more heat transfer surfaces of the portable housing;

an organ or tissue supporting surface configured to support an organ or tissue within said portable housing, wherein the portable housing is configured to be received by the transporter and wherein at least a portion of at least one of the one or more heat transfer surfaces of the compartment is in contact with at least a portion of at least one of the one or more heat transfer surfaces of the portable housing to allow effective heat transfer to or from the contents of the portable housing.

2. The apparatus of claim 1, wherein the cooling source is a cooling fluid.

3. The apparatus of claim 1, wherein the supporting surface is configured to support the organ or tissue while allowing effluent medical fluid to pass through said organ or tissue.

4. The apparatus of claim 1, wherein the compartment and the portable housing have substantially complementary configurations.

5. The apparatus of claim 4, wherein a majority of at least one of the one or more heat transfer surfaces of the compartment is in contact with a majority of at least one of the one or more heat transfer surfaces of the portable housing.

6. The apparatus of claim 4, wherein substantially all of at least one of the one or more heat transfer surfaces of the compartment is in contact with substantially all of at least one of the one or more heat transfer surfaces of the portable housing.

7. The apparatus of claim 4, wherein the portable housing is configured to mate with the compartment.

8. The apparatus of claim 4, wherein each of the compartment and the portable housing have multiple heat transfer surfaces forming the compartment and the portable housing, wherein the multiple heat transfer surfaces of each of the compartment and the portable housing are arranged such that a side cross-sectional view forms a trapezoid.

9. The apparatus of claim 4, wherein the compartment and the portable housing have complementary configurations forming a truncated cone.

10. The apparatus of claim 4, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are planar surfaces.

11. The apparatus of claim 4, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are non-planar surfaces.

12. The apparatus of claim 1, wherein the portable housing includes openings configured to allow tubing to pass through said openings and be connected to the organ.

13. The apparatus of claim 12, wherein the tubing can pass through the openings when the portable housing is mated with the compartment.

14. The apparatus of claim 1, wherein the transporter includes a heater.

15. The apparatus of claim 1, wherein the portable housing includes a handle.

16. The apparatus of claim 15, wherein the handle is accessible when the portable housing is mated with the compartment.

17. The apparatus of claim 1, wherein a bottom portion of the portable housing is liquid-tight and configured to collect medical fluid that has passed through a perfused organ to form an organ bath.

18. The apparatus of claim 2, wherein the cooling fluid is a cryogenic fluid.

19. The apparatus of claim 18, wherein the cryogenic fluid is at least one of ice, water, and a combination of water and ice.

20. A method of transporting an organ or a tissue, comprising:

placing the organ or tissue in a portable housing, the portable housing having one or more heat transfer surfaces;

placing the portable housing containing the organ or tissue in a compartment of a transporter configured to receive the portable housing, the compartment having one or more heat transfer surfaces, wherein at least a portion of at least one of the one or more heat transfer surfaces of the compartment is in contact with at least a portion of at least one of the one or more heat transfer surfaces of the portable housing;

transferring heat between a cooling source in the transporter, via at least a part of one of the one or more heat transfer surfaces of the compartment, to or from the contents of the portable housing; and

transporting the organ in said portable housing in said transporter.

21. The method of claim 20, further comprising placing the portable housing containing the organ in an organ or tissue diagnostic device configured to receive the portable

housing; and diagnosing the organ or tissue without removal of the organ from the portable housing.

22. The method of claim 20, further comprising placing the portable housing containing the organ or tissue in a perfusion device configured to receive the portable housing; and perfusing the organ or tissue without removal of the organ from the portable housing.

23. The method of claim 20, further comprising connecting tubing to the organ.

24. The method of claim 20, wherein the cooling source is a cooling fluid.

25. The method of claim 24, wherein the cooling fluid is a cryogenic fluid.

26. The method of claim 25, wherein the cryogenic fluid is at least one of ice, water, and a combination of ice and water.

27. The method of claim 20, wherein the compartment and the portable housing have substantially complementary configurations.

28. The method of claim 27, wherein each of the compartment and the portable housing have multiple heat transfer surfaces forming the compartment and the portable housing, wherein the multiple heat transfer surfaces of each of the compartment and the portable housing are arranged such that a side cross-sectional view forms a trapezoid.

29. The method of claim 27, wherein the compartment and the portable housing have complementary configurations forming a truncated cone.

30. The method of claim 20, wherein the portable housing includes tubing and connection devices to allow connection of an organ in the portable housing to tubing of at least one of the transporter, the organ diagnosis device and the organ perfusion device.

31. The method of claim 20, wherein the portable housing includes a handle and the handle is accessible when the portable housing is mated with the compartment.

32. The method of claim 24, wherein a bottom portion of the housing is liquid-tight and configured to collect medical fluid that has passed through a perfused organ to form an organ bath.

33. The method of claim 32, further comprising cooling the medical fluid with the cooling fluid.

34. The method of claim 20, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are planar surfaces.

35. The method of claim 20, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are non-planar surfaces.

36. The method of claim 20, wherein the portable housing includes openings configured to allow tubing to pass through said openings and be connected to the organ.

37. The method of claim 36, wherein the tubing can pass through the openings when the portable housing is mated with the compartment.

38. The method of claim 20, wherein the transporter includes a heater to heat the cooling source.

39. The method of claim 38, further comprising transferring heat from the cooling source to the medical fluid.

40. A system for holding an organ or tissue for transport of the organ or tissue, comprising:

- an organ or tissue transporter;

- a portable housing having one or more heat transfer surfaces;

- a compartment within the transporter having one or more heat transfer surfaces arranged to transfer heat between a cooling source in said transporter and at least a part of one of the one or more heat transfer surfaces of the portable housing;

- an organ or tissue supporting surface configured to support an organ or tissue within said portable housing, wherein the portable housing is configured to be received by the transporter and wherein at least a portion of at least one of the one or more heat transfer surfaces of the compartment is in contact with at least a portion of at least one of the one or more heat transfer surfaces of the portable housing to allow effective heat transfer to or from the contents of the portable housing.

41. The system of claim 40, wherein the cooling source is a cooling fluid.
42. The system of claim 40, wherein the supporting surface is configured to support the organ or tissue while allowing effluent medical fluid to pass through said organ or tissue.
43. The system of claim 40, wherein the compartment and the portable housing have substantially complementary configurations.
44. The system of claim 43, wherein a majority of at least one of the one or more heat transfer surfaces of the compartment is in contact with a majority of at least one of the one or more heat transfer surfaces of the portable housing.
45. The system of claim 43, wherein substantially all of at least one of the one or more heat transfer surfaces of the compartment is in contact with substantially all of at least one of the one or more heat transfer surfaces of the portable housing.
46. The system of claim 43, wherein the portable housing is configured to mate with the compartment.
47. The system of claim 43, wherein each of the compartment and the portable housing have multiple heat transfer surfaces forming the compartment and the portable housing, wherein the multiple heat transfer surfaces of each of the compartment and the portable housing are arranged such that a side cross-sectional view forms a trapezoid.
48. The system of claim 43, wherein the compartment and the portable housing have complementary configurations forming a truncated cone.
49. The system of claim 43, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are planar surfaces.
50. The system of claim 43, wherein the one or more heat transfer surfaces of the compartment and the one or more heat transfer surfaces of the portable housing are non-planar surfaces.
51. The system of claim 40, wherein the portable housing includes openings configured to allow tubing to pass through said openings and be connected to the organ.
52. The system of claim 51, wherein the tubing can pass through the openings when the portable housing is mated with the compartment.
53. The system of claim 40, wherein the transporter includes a heater.
54. The system of claim 40, wherein the portable housing includes a handle.
55. The system of claim 54, wherein the handle is accessible when the portable housing is mated with the compartment.

56. The system of claim 40, wherein a bottom portion of the portable housing is liquid-tight and configured to collect medical fluid that has passed through a perfused organ to form an organ bath.

57. The system of claim 41, wherein the cooling fluid is a cryogenic fluid.

58. The system of claim 57, wherein the cryogenic fluid is at least one of ice, water, and a combination of water and ice.

59. The system of claim 40, further comprising:

at least one of an organ perfusion device and an organ diagnostic device, wherein the portable housing is configured to be received by the at least one organ perfusion device and the organ diagnostic device and to allow at least one of perfusion and diagnosis of the organ without removal of the organ from the portable housing.